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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,727	12/16/2003	Yoon Hyung Roh	123056-05004426	3641

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EXAMINER	
LENNOX, NATALIE	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/735,727	ROH ET AL.	
	Examiner	Art Unit	
	Natalie Lennox	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :December 16, 2003, March 26, 2004.

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because of improper language and format. Correction is required. See MPEP § 608.01(b).

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Objections

3. Claim 7 is objected to because of the following informalities: Step (e) for the method of claim 7 appears to be incomplete. For purposes of examination, the examiner interprets, based on the information provided in claim 1 and the specification, that the step (e) reads, "if the translation pattern matching to the construction pattern fails, analyzing a clause unit structure of the construction pattern." Appropriate correction is required.

4. Claim 9 is objected to because of the following informalities: The phrase "the reduced by" in the 3rd limitation of claim 9, which starts with "if the pattern translation," appears to be added by mistake. For purposes of examination, the examiner interprets

the limitation to read "if the pattern translation using the reduced construction pattern fails..." Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 2, and 4-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Seo*** et al. (CaptionEye/EK: English-to-Korean Caption Translation System using the Sentence Pattern, 2001) in view of ***Bernth*** et al. (US Patent 6,285,978) and ***Roh*** et al. (Long Sentence Partitioning using Structure Analysis for Machine Translation, November 2001).

As per claim 1, ***Seo*** teaches a hybrid automatic translation apparatus employing a combination of a rule-based method and a translation pattern method, the hybrid automatic translation apparatus comprising:

a morpheme analyzing block for analyzing a morpheme of an inputted source sentence (Section 2 – [Fixed Pattern Recognition] does the morphological analysis);

a tagging block for determining parts of speech with respect to the result of the morphological analysis (Section 2 – [Fixed Pattern Recognition] does the morphological analysis and tagging, e.g. The (det) enormous amounts of (det) special (adj), etc.);

a construction pattern generating block for extracting only a chunking result of phrases belonging to sub-category of verb in the parsing tree to generate a construction

pattern (Section 2 – [Protector Detection] and [Partial Parsing between Protectors], wherein the Protector Detection module detects the main verbs in the sentence and the Partial Parsing does the chunking of the phrases in between the verbs or protectors, e.g. (det det adj noun noun => NP), etc. The result is the source sentence pattern (interpreted as the construction pattern) as shown under the [Partial Sentence Pattern Processor]: n/CVnVn/CnV);

a construction pattern translating block for translating the construction pattern by using a translation pattern (Section 2 – second paragraph under [Partial Parsing between Protectors]. "The resulting slot symbol is encoded to the key word in source sentence pattern (construction pattern) database."); and

a partial pattern translating block for recognizing a partial construction pattern with respect to each sub-clause with reference to the result of the clause structure analysis, and performing a translation using a partial translation pattern (Section 5 – Partial Sentence Pattern Processor).

However, ***Seo*** does not specifically mention the apparatus comprising:

a syntactic structure analyzing block for performing a parsing to the tagging result to output a parsing tree; and

a clause structure analyzing block for analyzing a clausal structure of the construction pattern if the translation pattern matching of the construction pattern fails.

Conversely, ***Bernth*** teaches a syntactic structure analyzing block for performing a parsing to the tagging result to output a parsing tree (***Bernth***'s Col. 5, lines 49-55 and 61-66); and ***Roh*** teaches a clause structure analyzing block for analyzing a clausal

structure of the construction pattern if the translation pattern matching of the construction pattern fails (***Roh***'s Sections 4.2, 4.3, and 4.4, which are all part of the clausal structure analysis as determined in Section 6, 2nd paragraph, and Fig. 3, which shows the clausal structure analysis. Note that ***Roh*** does not specifically mention that the clausal structure analysis is done if the translation pattern matching to the construction pattern fails, however it would have been obvious to one having ordinary skill in the art at the time of the invention that since ***Roh*** applied the clausal structure analysis to long sentences, it would be understood that ***Roh*** assumed that the translation of a construction pattern for a long sentence would often fail).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of a syntactic structure analyzing block for performing a parsing to the tagging result to output a parsing tree as taught by ***Bernth*** for ***Seo***'s apparatus because ***Bernth*** provides a parse structure as a formal representation of one of the source segments (***Bernth***'s Col. 1, lines 45-46).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of a clause structure analyzing block for analyzing a clausal structure of the construction pattern if the translation pattern matching of the construction pattern fails as taught by ***Roh*** for ***Seo***'s apparatus because ***Roh*** provides long sentence partitioning using structure analysis to prevent the number of sentence pattern to build from increasing explosively and causing serious coverage problems while the length of a sentence increases (***Roh***'s Section 3, last paragraph).

As per claim 2, ***Seo***, in view of ***Bernth*** and ***Roh***, teach the apparatus according to claim 1, wherein the morpheme analyzing block performs a preprocessing chunking when the morphological analysis of the inputted source sentence is performed (***Seo***'s Section 4).

As per claim 4, ***Seo***, in view of ***Bernth*** and ***Roh***, teach the apparatus according to claim 1, wherein the syntactic structure analyzing block selects two or three division point candidates based on divisional point syntactic clue, a presence of main verb, and a length of divided sentence, if the inputted sentence is a long sentence, a length of which is larger than a specific value, performs a parsing to the divided sentences according to the candidates, selects an optimum division point by applying parsing weights to the parsing result of the divided sentence, and outputs the syntactic parsing result according to the selected division point (***Bernth***'s parser 215 and source evaluation module 220 from Figs. 2 and 4, also Col. 6, lines 14-36. The parser evaluates the different complexity choices for producing the parse structure. These complexities include segmenting and tokenizing 405, lexical choice 410, and sentence length 450, among others shown in Fig. 4. The segmenting and tokenizing 405 take into consideration the punctuation complexities (divisional point syntactic clue) (Col. 10, lines 1-21); the lexical choice takes into consideration the lexical analyses per word, different parts of speech, and ambiguous combinations of parts of speech (including verbs) (Col. 11, lines 16-30); and the sentence length 450 takes into consideration the length of a segment (also parse evaluation 420, Col. 13, lines 11-22), penalizing the length of a sentence according to some categories of length, e.g. penalizing segments

of 26 to 30 words (Col. 16, lines 32-49). The parse structure is evaluated according to the severity of the complexity or combination of severities (weighting factors), and a final parse structure is outputted).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of a syntactic structure analyzing block that selects two or three division point candidates based on divisional point syntactic clue, a presence of main verb, and a length of divided sentence, if the inputted sentence is a long sentence, a length of which is larger than a specific value, performs a parsing to the divided sentences according to the candidates, selects an optimum division point by applying parsing weights to the parsing result of the divided sentence, and outputs the syntactic parsing result according to the selected division point as taught by ***Bernth*** for ***Seo***'s apparatus because by evaluating multiple complexity choices for the parse structure, different severities of complexity are determined, which makes it easier to select the less complex in order to produce an optimum parse structure (Col. 4, lines 6-8).

As per claim 5, ***Seo***, in view of ***Bernth*** and ***Roh***, teach the apparatus according to claim 1, wherein the partial pattern translating block generates partial construction patterns with respect to sub-clause of a translation failure node with reference to the result of the clause structure analysis, performs a pattern translation to the partial construction pattern, replaces the translation result of the partial construction pattern with a sentence symbol "S", performs a pattern translation with respect to the construction pattern reduced by the pattern replacement, and generates a final

translation result by performing a translation according to the construction components if the pattern translation using the reduced construction pattern fails (***Seo***'s Section 2 [Partial Parsing between Protectors], 2nd paragraph, and Sections 5 and 5.2., wherein the translation of the construction components is inherently done by the pattern translator as the sentence becomes simpler).

As per claim 6, ***Seo***, in view of ***Bernth*** and ***Roh***, teach the apparatus according to claim 5, wherein the partial pattern translating block performs a top-down partial pattern translation, which performs a partial pattern translation to a sub-clause of the sub-clause, with reference to the result of the clause structure analysis, if the partial pattern translation of the sub-clause fails (***Roh***'s Section 3, 3rd paragraph "the new machine translation methodology has characteristics of both shallow bottom-up parsing by protectors and top-down matching by structure-oriented sentence patterns" (as shown in Fig. 3).).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of a partial pattern translating block that performs a top-down partial pattern translation, which performs a partial pattern translation to a sub-clause of the sub-clause, with reference to the result of the clause structure analysis, if the partial pattern translation of the sub-clause fails as taught by ***Roh*** for ***Seo***'s apparatus because as the translation goes from top to bottom the patterns are simplified which in turn gives more options for a match.

As per claim 7, ***Seo*** teaches a hybrid automatic translation method employing a combination of a rule-based method and a translation pattern method, the hybrid automatic translation method comprising the steps of:

(a) analyzing a morpheme of an inputted source sentence, performing a preprocessing chunking, and tagging the chunking result (Section 4 – Partial Parser and Section 2 – [Fixed Pattern Recognition]);

(c) generating construction patterns by extracting only the chunking result of phrases belonging to sub-category of verb in the parsing tree (Section 2 – [Protector Detection] and [Partial Parsing between Protectors], wherein the Protector Detection module detects the main verbs in the sentence and the Partial Parsing does the chunking of the phrases in between the verbs or protectors, eg. (det det adj noun noun => NP), etc. The result is the source sentence pattern (interpreted as the construction pattern) as shown under the [Partial Sentence Pattern Processor]: n/CVnVn/CnV); and

(d) translating the construction pattern by using a translation pattern (Section 2 – second paragraph under [Partial Parsing between Protectors]. "The resulting slot symbol is encoded to the key word in source sentence pattern (construction pattern) database."); and

(f) generating a partial construction pattern with respect to sub-clause of translation failure node with reference to the result of the clause structure analysis, performing a pattern translation with respect to the partial construction pattern, and outputting a final translation result by combining the results of the pattern translation

(Section 5 – Partial Sentence Pattern Processor, and Section 5.2 – Simple Sentence Reduction and Whole Sentence Translation).

However, ***Seo*** does not specifically mention the method comprising:

(b) parsing the tagging result to output a parsing tree; and

(e) if the translation pattern matching to the construction pattern fails, analyzing a clause unit structure of the construction pattern.

Conversely, ***Bernth*** teaches parsing the tagging result to output a parsing tree (***Bernth***'s Col. 5, lines 49-55 and 61-66); and ***Roh*** teaches analyzing a clause unit structure of the construction pattern if the translation pattern matching to the construction pattern fails (***Roh***'s Sections 4.2, 4.3, and 4.4, which are all part of the clausal structure analysis as determined in Section 6, 2nd paragraph, and Fig. 3, which shows the clause structure analysis. Note that Roh does not specifically mention that the clausal structure analysis is done if the translation pattern matching to the construction pattern fails, however it would have been obvious to one having ordinary skill in the art at the time of the invention that since Roh applied the clausal structure analysis to long sentences, it would be understood that Roh assumed that the translation of a construction pattern for a long sentence would often fail).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of parsing the tagging result to output a parsing tree as taught by ***Bernth*** for ***Seo***'s apparatus because ***Bernth*** provides a parse structure as a formal representation of one of the source segments (***Bernth***'s Col. 1, lines 45-46).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of analyzing a clause unit structure of the construction pattern if the translation pattern matching to the construction pattern fails as taught by ***Roh*** for ***Seo***'s apparatus because ***Roh*** provides long sentence partitioning using structure analysis to prevent the number of sentence pattern to build from increasing explosively and causing serious coverage problems while the length of a sentence increases (***Roh***'s Section 3, last paragraph).

As per claim 8, ***Seo***, in view of ***Bernth*** and ***Roh***, teach the method of claim 7, wherein the step (b) includes the steps of:

selecting two or three division point candidates based on divisional point syntactic clue, a presence of main verb, and a length of divided sentence if the inputted sentence is a long sentence, a length of which is larger than a specific value (***Bernth***'s parser 215 and source evaluation module 220 from Figs. 2 and 4, also Col. 6, lines 14-36. The parser evaluates the different complexity choices for producing the parse structure. These complexities include segmenting and tokenizing 405, lexical choice 410, and sentence length 450, among others shown in Fig. 4. The segmenting and tokenizing 405 take into consideration the punctuation complexities (divisional point syntactic clue) (Col. 10, lines 1-21); the lexical choice takes into consideration the lexical analyses per word, different parts of speech, and ambiguous combinations of parts of speech (including verbs) (Col. 11, lines 16-30); and the sentence length 450 takes into consideration the length of a segment (also parse evaluation 420, Col. 13,

lines 11-22), penalizing the length of a sentence according to some categories of length, eg. penalizing segments of 26 to 30 words (Col. 16, lines 32-49).);

performing a parsing to the divided sentences according to the candidates (Col. 6, lines 14-36, wherein the source evaluation module/process 220 generates a source indication of the complexity of choices in producing the source parse structure using any combination of complexity of choices which include segmenting and tokenizing 405, lexical choice 410, and sentence length 450); and

selecting an optimum division point by applying parsing weights to the parsing result of the divided sentence, and outputting the syntactic parsing result according to the selected division point (Col. 6, lines 26-36, wherein the source evaluation/process 220 writes a summary of the complexities encountered during the evaluation process and makes its determination according to the severity of the complexity (weighting factor) and outputs the source parse structure (Col. 6, lines 37-38).).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of a syntactic structure analyzing block that selects two or three division point candidates based on divisional point syntactic clue, a presence of main verb, and a length of divided sentence, if the inputted sentence is a long sentence, a length of which is larger than a specific value, performs a parsing to the divided sentences according to the candidates, selects an optimum division point by applying parsing weights to the parsing result of the divided sentence, and outputs the syntactic parsing result according to the selected division point as taught by ***Bernth*** for ***Seo***'s apparatus because by evaluating multiple complexity choices for the parse

structure, different severities of complexity are determined, which makes it easier to select the less complex in order to produce an optimum parse structure (Col. 4, lines 6-8).

As per claim 9, ***Seo***, in view of ***Bernth*** and ***Roh***, teach the method of claim 7, wherein the step (f) includes the steps of:

generating partial construction patterns with respect to sub-clause of a translation failure node with reference to the result of the clause structure analysis, and performing a pattern translation with respect to the partial construction pattern (***Seo***'s Section 2 - [Partial Parsing between Protectors], 2nd paragraph, and [Partial Sentence Pattern Processor], also Sections 5, and 5.2);

replacing the translation result of the partial construction pattern with a sentence symbol "S", and performing a pattern translation to the construction pattern reduced by the pattern replacement (***Seo***'s Section 5.2); and

if the pattern translation using the reduced construction pattern fails, generating a final translation result by performing a translation according to the construction components (***Seo***'s Section 2 - [Partial Parsing between Protectors], 2nd paragraph, also Section 5.2, wherein the translation of the construction components is inherently done by the pattern translator as the sentence becomes simpler).

As per claim 10, ***Seo***, in view of ***Bernth*** and ***Roh***, teach the method of claim 9, wherein if the partial pattern translation of the sub-clause fails, the step (f) performs a top-down partial pattern translation, which performs a partial pattern translation with respect to a sub-clause of the sub-clause, with reference to the result of the clause

structure analysis (***Roh***'s Section 3, 3rd paragraph "the new machine translation methodology has characteristics of both shallow bottom-up parsing by protectors and top-down matching by structure-oriented sentence patterns" (as shown in Fig. 3).).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of a partial pattern translating block that performs a top-down partial pattern translation, which performs a partial pattern translation to a sub-clause of the sub-clause, with reference to the result of the clause structure analysis, if the partial pattern translation of the sub-clause fails as taught by ***Roh*** for ***Seo***'s apparatus because as the translation goes from top to bottom the patterns are simplified which in turn gives more options for a match.

As per claims 11-14, ***Seo***, in view of ***Bernth*** and ***Roh***, teach a computer-readable medium storing program instructions, the program instruction being disposed on a computer to perform the method claimed in claims 7-10, respectively (***Seo***'s processing (e.g. Partial Sentence Pattern Processor) and use of databases (e.g. Target Sentence Patter DB) suggests the presence of a computer readable medium storing the processing instructions.).

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over ***Seo*** et al. (CaptionEye/EK: English-to-Korean Caption Translation System using the Sentence Pattern, 2001) in view of ***Bernth*** et al. (US Patent 6,285,978) and ***Roh*** et al. (Long Sentence Partitioning using Structure Analysis for Machine Translation, November

2001) as applied to claim 1 above, and further in view of ***Horiguchi*** et al. (US Patent 6,330,530).

As per claim 3, ***Seo***, in view of ***Bernth*** and ***Roh***, teach the apparatus according to claim 1, but do not specifically mention the tagging block outputting two optimum candidates as the tagging result to the syntactic structure analyzing block. However, ***Horiguchi*** teaches the tagging block outputting two optimum candidates as the tagging result to the syntactic structure analyzing block (Col. 6, lines 35-40, wherein the feature structure 2 shows the word "want" with its two optimum candidates, noun and verb, as outputted by the morphological analysis module 206, which identifies the root forms, grammatical categories, and other lexical features of the words (Col. 6, lines 16-19)).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of a tagging block that outputs two optimum candidates as the tagging result to the syntactic structure analyzing block as taught by ***Horiguchi*** for ***Seo***'s apparatus, as modified by ***Roh*** and ***Bernth***, because ***Horiguchi*** provides a method for transforming input source language linguistic structures (SLS) to target language linguistic structures (TLS) (Col. 2, lines 39-41).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

9. Franz et al. (US Patent 6,356,865) provides a method and apparatus for performing spoken language translation.

10. Choi et al. (Hybrid Approaches to Improvement of Translation Quality in Web-based English-Korean Machine Translation, August 1998) provides an English-to-Korean machine translation system that does English sentence analysis, transforms the result (parse tree) into an intermediate representation, and the transforms it into a Korean syntactic structure to construct a Korean sentence (Section 1 - System Overview).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Natalie Lennox whose telephone number is (571) 270-1649. The examiner can normally be reached on Monday to Friday 9:30 am - 7 pm (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NL 07/19/2007

RICHEMOND DORVIL
SUPERVISORY PATENT EXAMINER